Space Weather Forecast

Issued on Wednesday, 27 April 2022 at 13:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares (R1/R2 Radio Blackouts), with a very slight chance of Strong flares (R3 Radio Blackouts).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with just Common-class flares observed. There are currently nine sunspot regions on the visible disc, with the most significant of these in the far northwest quadrant. The remaining regions are all considered to be rather simple and small magnetic regions or benign spots. An earlier Common-class flare in the northern hemisphere near the centre disc appears responsible for a Coronal Mass Ejection (CME) resulting from a filament eruption. Initial imagery suggests this CME is directed to the north of earth, however, further imagery and modelling is required to confirm this. Otherwise no Earth-directed CMEs have been observed in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind has slowly and erratically increased during the period, but remains at slightly elevated levels. The overall magnetic field strength has been mainly weak, but with an increase to Moderate levels from around 27/0600 UTC. The important north-south component of the solar wind has generally varied weakly, though has been Moderate and mainly positive since 27/0600 UTC, though sharply deviated to negative just before 27/1200 UTC. Geomagnetic activity was Quiet (Kp 1-2) throughout.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low, with a chance of Moderate activity and a very slight chance of High activity.

Solar Wind / Geomagnetic Activity: No Earth directed CMEs are currently forecast during the period, however, a filament eruption and associated CME from a flare at 27/0907 UTC in the northern hemisphere, near the centre disc, requires further imagery and modelling to confirm a miss at Earth. Solar winds are expected to be slightly elevated speeds through 27 April and much of 28 April. Speeds are then forecast to increase to 500-550km/s either late on 28 April or on 29 April due to the onset of the high speed stream from a Coronal Hole. Geomagnetic activity is forecast to be mainly Quiet, with a chance of Unsettled or an Active interval on 27 and 28 April, but could reach Active to G1/Minor storms on 28 April and into 29 April due to the expected onset of the high speed stream. Unsettled intervals, with a risk of Active are then likely on 29 and 30 April.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to remain at background levels with no solar radiation storms occurring. However, there is a slight chance of solar radiation storms, as the moderately complex sunspot region in the northwest of the visible disc moves into a position where any energetic particles that may be released during larger flares could reach Earth more effectively.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	20	20	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	20	20
Very Active	R3 to R5 X	No	5	5	3	3

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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